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POPULATION GROWTH AND STABILITY IN ALBERTA HINTERLAND BOOM-TOWNS*

by

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ABSTRACT

This paper examines population growth and stability in the northern Alberta community of Fort McMurray and in the Cold Lake region which contains several distinct communities. Census data and 1979 survey data are used to look at these community characteristics while the survey data are also used to examine the migration intentions of current residents. Large scale economic development in Fort McMurray over the last two decades has resulted in rapid population growth and low population stability, particularly in comparison to the Cold Lake region where similar development is anticipated. Examination of these differences is followed by a discussion of some of the attempts which have been made to stabilize the Fort McMurray population.

Introduction

Over the past two decades, the community of Fort McMurray, situated about 450 km north of Edmonton, has twice experienced population booms associated with the establishment of large oil sands extraction plants. Further similar developments are planned for the region north of Fort McMurray while a somewhat different type of extraction operation has been designed for the Cold Lake region (CLR) near the Alberta–Saskatchewan provincial border. The two operating Fort McMurray plants (Suncor and Syncrude) are the first commercial operations capable of producing synthetic crude oil from the bitumen found in the Athabasca Oil Sands which cover much of northeast Alberta and northwest Saskatchewan. North of Fort McMurray, the deposits are near the surface and can be strip-mined. In the Cold Lake region, deposits are deeper. The proposed 141,000 BPD Imperial Oil project would use steam injection to increase the viscosity of the bitumen and force it to the surface. In both kinds of operation the bitumen is extracted, refined to make synthetic crude oil, and piped to Edmonton.

Suncor (originally GCOS) was constructed north of Fort McMurray between 1963 and 1968 with a peak labour force of 2300. It now employs 1500 to 1800 workers and in 1979 produced an average of 45,000 BPD of synthetic crude oil. Syncrude, located a little further north, was built between 1973 and 1978 with a peak construction labour force of about 7000. The project cost in excess of $3 billion and has a design capacity of 125,000 BPD. It employs an operating labour force of about 3000. Fort McMurray was previously a small hinterland town, but construction of the two plants brought rapid population growth and population instability. Migrants have shaped the character of the community, and population instability has created problems for the private and public sector organizations responsible for the community's development.

The project proposed for the Cold Lake portion of the Athabasca Oil Sands (and, since 1981, indefinitely postponed) would have required equally large construction and operations phase workforces. Since the CLR is more heterogenous in industrial character and has a larger current population than did pre-Suncor Fort McMurray, the effects of the movement of thousands of individuals and families into and out of the

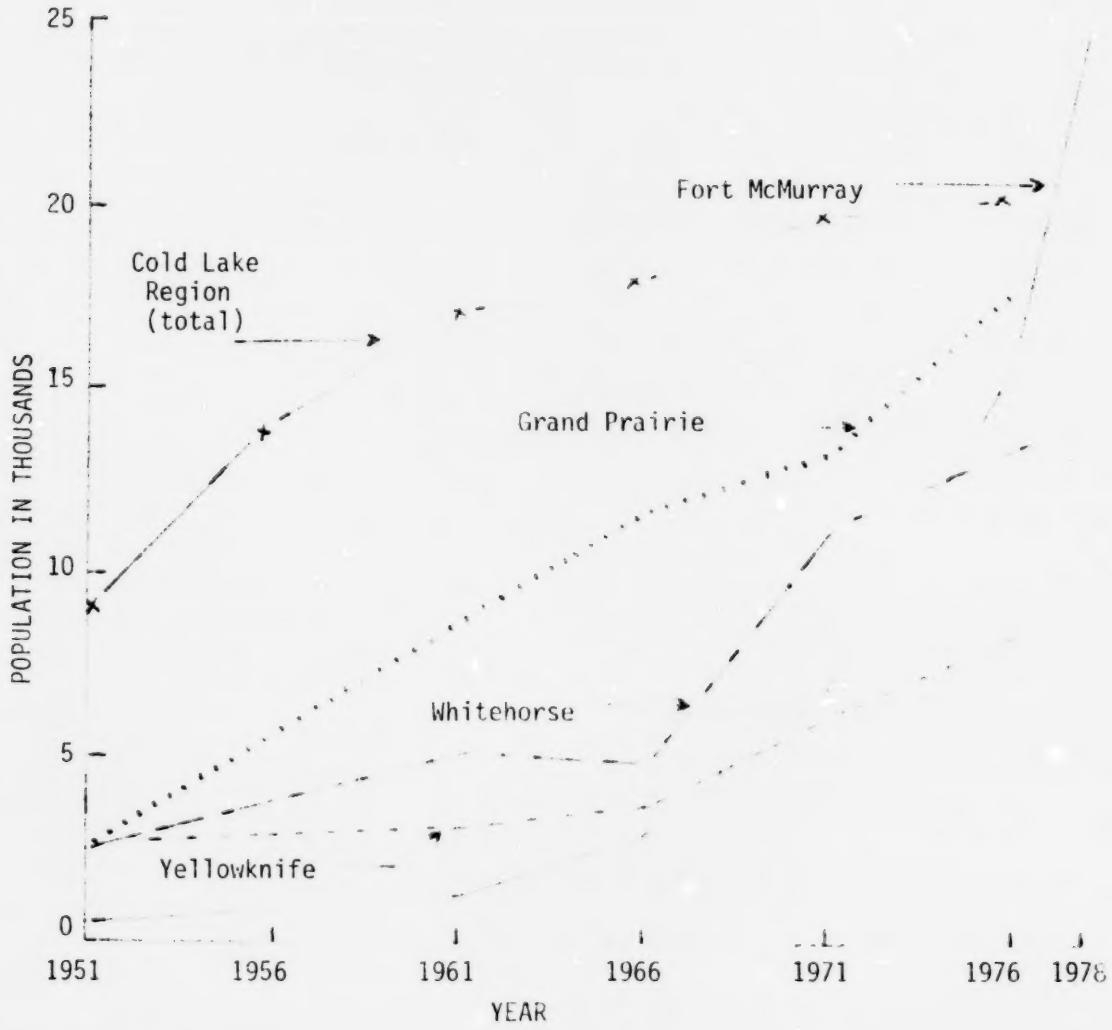
CLR, alhough equally large, would be different. Thus, while there is an implied pre-versus post-impact comparison in this design, it is necessary to emphasize that the two areas are not matched. The CLR is not a "control" case for the Fort McMurray study. What we are comparing are two different industrial development scenarios. Despite this, a comparison of previous population growth and present population stability patterns in the two settings allows some tentative speculations about the demographic consequences of development.

First we examine population growth and stability before proceeding to a more detailed analysis of individual geographic mobility and length of residence. In the examination of the determinants and consequences of residential stability, we will emphasize policy factors that have been manipulated to encourage higher stability, as well as those that might yet be altered. In Fort McMurray, attempts have been made to maximize stability through the selective recruitment of married workers and through the creation of conditions within the community judged to encourage longer residence. Both government and industry have created elaborate dwelling subsidies in the form of leasing and ownership plans which were intended to encourage longer residence.

Population Growth

Past developments in Fort McMurray have led to periods of very rapid population growth (Figure 1). In the 1950's, Fort McMurray was a isolated town of less than 1000 inhabitants who survived booms and busts in a mixed local economy based on trapping, timber, trading, and transportation (river access to the Canadian north). By 1979 it had become a city of over 27,000 with an oil-based industrial structure. The population grew at an average rate of about 2.8% per year between 1951 and 1961. While the Suncor project was under construction between 1963 and 1968, growth averaged 38.5% per year. In the lull between construction booms as Suncor went into production (1968 to 1972), growth averaged 4.3% per year. It again increased to an average of 21.4% during Syncrude's construction (1973 to 1978) and since appears to have slowed to under 5%. Growth rates obviously cycle with construction, although even non-construction periods in this town have seen substantial population growth. In addition, the full impact of construction is underestimated by data

Figure 1. Population Growth in north-western Canadian Communities.



Sources: Data from Buse (1978), except for Fort McMurray data from Municipal Censuses, and Cold Lake Region data from Gartrell et al. (1981).

describing the growth of the town of Fort McMurray. During the construction booms, the majority of construction workers were housed at construction sites and thus were not included in census counts for Fort McMurray.

In comparison, population growth in the CLR has been much slower. In fact, much of the growth shown in Figure 1 is the result of a development boom surrounding the establishment of a Canadian Forces Base near the town of Grand Centre. The base was opened in 1954 and in 1976 was still the tenth largest community in the province with a population of 5474. If CFB Cold Lake and the Indian reservations in the region are omitted, population increased only 0.7% between 1961 and 1966, 1.7% between 1966 and 1971, and 6.2% between 1971 and 1976. However, different segments of the population exhibited very different growth rates during this period. Bonnyville, the largest town in the region with a population of 2873 in 1976, grew very slowly between 1961 and 1976. Over the same period, Grand Centre's size almost doubled (1493 to 2780), largely as a consequence of being the closest community to the military base. The third largest town, Cold Lake, remained almost constant at about 1317 (1976) following the initial boom associated with the construction of CFB Cold Lake. The rural area, like most Canadian rural areas, registered a population decline from 7227 in 1961 to 5925 in 1976.

Figure 1 puts the minimal growth of the CLR and the huge growth of Fort McMurray into perspective. Whitehorse, the capital of the Yukon Territory, and Yellowknife, the capital of the North West Territories, have both grown in size as the Canadian north-west has begun to attract more government and industry attention for its oil and mineral deposits. But neither have grown as quickly as has Fort McMurray which is in the middle of a very large-scale development of one of these resources. Grand Prairie, a regional service centre in the Peace River region of Alberta, grew relatively rapidly throughout the period covered in Figure 1. The several years following that era have seen a faster rate of growth as a large nearby natural gas field has generated a great deal of exploration and drilling activity. Resource development projects (and military developments) have large demographic effects on the regions in which they occur but, in the Canadian north-west, few have had an impact as large as the mega-projects surrounding oil sands deposits.

Population Stability

One of the difficulties faced by rapid growth resource development communities is the dramatic reduction in residential stability because of high levels of migration and turnover (MacMillan et al. 1974; Himelfarb 1976; Bowles 1981). One of the immediate consequences is increased stress for individuals and families (Dohrenwend and Dohrenwend 1974; Porteous 1976; Jackson and Poushinsky 1977; Van Dyke and Loberg 1978). Turnover also introduces substantial costs and operating difficulties for employers who must recruit and train new employees, often in tight labour markets (Price 1977; Grant and Vandercamp 1976). Furthermore, rapid population growth means an unstable clientele for service agencies, schools, and local businesses (Riffel 1975; Van Dyke and Loberg 1978). This may make it difficult to create a community with the quality of life and social support necessary for productive enterprise (Zehner 1977; Matras 1977).

The 1971 Canadian census reported that 53% of the population of Canada five years of age and older had not moved (even locally) in the five years prior to the enumeration (Kalbach and McVey 1979:126). Of the adult (over age 16) residents of Fort McMurray interviewed in a 1979 survey (Gartrell et al. 1980), only 18% had not moved in the previous five years. However, 60% of the general population of the CLR (excluding CFB Cold Lake and Metis settlements) had not moved in the five years prior to a similar survey (Gartrell et al. 1981). Compared to the Canadian population, residents of Fort McMurray had been highly mobile, while those in the CLR had exhibited high stability.

The characteristics associated with geographic mobility have been extensively documented for the general population of the U.S.A. and Canada (Ritchey 1976; Shaw 1975; Greenwood 1975; Kalbach and McVey 1979; Stone and Fletcher 1977). Shorter term residents are more likely to be young, single males, and members of smaller households. Migrants are more likely to be highly educated, from urban backgrounds, to have moved frequently in the past, and to have unfavourable housing tenures (renters) and housing types (other than single family housing). The population composition of Fort McMurray appears to conform to this profile. The town's low stability is coupled with a fairly high sex ratio typical of northern communities in Canada (112 males per

Table 1 Population Stability: Years Resident in Fort McMurray and The Cold Lake Region (Survey Estimates)*

Years Resident	Fort McMurray 1969	Fort McMurray 1979	Cold Lake Region 1979
	Percent		
Less than .34	15.0	13.0	4.4
.34 - 1.00	13.2	15.8	5.6
1.00 - 2.00	23.3	23.0	5.8
2.00 - 4.50	36.0	25.6	13.6
4.50 - 10.00	4.9	15.3	15.2
10.00 and over	7.6	6.9	55.5
	451	418	940

*Survey estimates for Fort McMurray in 1969 were obtained from John Matthiasson's questionnaire survey of one in four households (Matthiasson, 1970; 1971).

100 females). Compared to the country as a whole Fort McMurray also had a high proportion of young adults (27% between the ages of 20 and 29 versus 18% for Canada) and few old people (7% over 44 versus 18% for Canada). The community had a low proportion of single family housing (28%). However, Fort McMurray also had a relatively high proportion of married adults (75% in 1971, 77% in 1979) compared to 76% for Canada as a whole (1976). In the periods not dominated by construction activity, the town has been fairly 'normal' in this respect.

Research Design

The CLR was surveyed in the fall of 1979 (Gartrell et al. 1981), before the construction of the Imperial Oil project was to begin. Fort McMurray was surveyed in the spring of 1979 (Gartrell et al. 1980), after Syncrude had been in operation about a year and Suncor had been in operation over 10 years. Both studies used the dwelling unit as the primary sampling unit for systematic sub-samples drawn with sub-areas. In Fort McMurray, one adult over 16 years of age was randomly selected from each household, resulting in a sample of 430 and a completion rate of 69%. In the CLR study any adult 18 or older was interviewed with preferance given to males. The total of 1075 adults interviewed represented a completion rate of 82%. The elimination of CFB Cold Lake and Metis communities because of large and systematic differences between these sub-populations and the rest of the region (Gartrell et al. 1981), and the weighting of small sub-regions to compensate for larger sampling fractions resulted in a weighted working sample of 940. Comparisons of this sample to the 1976 Canadian census returns for the region, and of the Fort McMurray sample to 1979 municipal census results showed both samples to be representative of their respective populations in most important respects. However, because of the greater difficulty in contacting male adults, both samples slightly over-represented females.

Length of Residence in the Community/Region

Length of residence was calculated from respondents' reports of the month and year in which they moved to the area. Our use of this indicator as a measure of stability recognizes the existence of two sources of variation. Length of residence may be interpreted to mean that people came earlier, or it can be interpreted to mean that they stayed longer. For example, evidence that less educated respondents have a longer average length of residence might mean that earlier migration cohorts were less well educated. It might also mean that more educated people leave sooner, or both explanations might be involved. Without interviewing individuals who have come and left these two regions, analysis of community stability remains incomplete. It cannot differentiate between interpretations that suggest different times of arrival and those which stress length of residence itself.

Respondents in the 1979 Fort McMurray study averaged 3.2 years of residence. While only three of the 430 adults had been born in Fort McMurray, 30% grew up in Alberta and 41% had moved to Fort McMurray from Alberta. In comparison, 21% of the CLR sample had been born in that area and, even among migrants, stability was very high. Their average length of residence was 20.6 years. About 59% of the CLR sample had grown up in Alberta, and 49% of those who had moved to the region did so from within Alberta.

In most respects, the distribution of length of residence in Fort McMurray was very similar in 1979 to what it had been in 1969 (Table 1). About one-half of the residents in each era had lived in the community for less than two years. John Matthiasson's 1969 survey followed soon after the beginning of Suncor's production, while the 1979 study was undertaken in the early phase of Syncrude operations (Matthiasson, 1970; 1971). The similarity of length of residence distributions is partially a result of the stages the respective projects had reached when the studies were done. The real differences in Table 1 are between Fort McMurray and the CLR. Almost three-quarters of respondents in the Cold Lake study had lived in the area for more than 4.5 years compared to between 12% (1969) and 22% (1979) of the Fort McMurray samples.

Table 2 Length of Residence: Reduced Form Multiple Regression Results for Fort McMurray and the Cold Lake Region (Survey Estimates, 1979)*.

	Fort McMurray				Cold Lake Region			
Variable**	B	St. Error	Beta	r	B	St. Error	Beta	r
1. Age	.130	.020	.313	.335	.564	.034	.490	.639
2. Yrs. Resident where grew up	-.090	.025	-.165	-.005	.206	.035	.159	.543
3. Alberta Origin***	1.561	.342	.195	.305	4.876	1.317	.123	.281
4. Urban Origin	-.338	.110	-.128	-.176	-2.837	.914	-.077	-.284
5. Single Family Dwelling	1.683	.391	.190	.302	2.215	1.056	.047	.228
6. Waterways	4.485	.849	.222	.214				
7. Lower Town	1.151	.350	.145	.118				
8. Home Owner	1.605	.381	.187	.292				
9. Lived in Other Resource Comm.	-.830	.363	-.097	-.085				
10. Married	-.882	.399	-.098	-.024				
11. Rural Farm					5.285	1.217	.108	.248
12. Education Yrs.					-.629	.131	-.120	-.464
13. Alberta Born					4.982	1.131	.126	.228
14. Household Size					-1.092	.281	-.089	-.171
15. Roman Catholic					3.051	.867	.075	.108
R^2 = .375					R^2 = .601			

*All B's (partial regression coefficients) are significant at the .05 level.

**Variables 3 through 11, 13 and 15 were coded as binary variables.

***For the CLR this variable indicated whether or not the respondent grew up in Alberta. In the Fort McMurray sample it indicated whether or not the respondent had moved to Fort McMurray from outside Alberta.

There was considerable variation by sub-community within the two study areas, but these internal variations were larger in the CLR. Here, rural farm residents and residents of the town of Bonnyville (which appears to be a preferred retirement centre) had lived in the region longer than had residents of the towns of Cold Lake and Grand Centre. Similarly, within Fort McMurray areas developed earlier had higher average lengths of residence with Waterways, the original settlement site, showing an average twice that of any other area.

In both Fort McMurray and the CLR, natives of Alberta had a longer average length of residence and migrants from urban areas had a shorter average. But while most of Fort McMurray's residents had come from urban places (52%), the CLR had a population which had either grown up in that area or one like it. About 31% grew up in rural areas, 64% in small towns, and only 5% in urban areas.

As expected, age differences in stability were large in both samples. In Fort McMurray, length of residence increased linearly with age with the relatively small 45 and older group averaging 6.5 years. In the CLR there was no significant increase in length of residence between 18 and 30 years of age. For those over 30, the relationship between length of residence and age was positive, linear and had a slope almost equal to 1.0. As is typical of such rural areas, many of the young adults who grew up in the area left for work or education reasons. However, little turnover appeared to have occurred among those over 30. Sex differences in length of residence were not significant in either sample. In the CLR, the married had lived longer in the area, but this was not the case in Fort McMurray where the married averaged 3.2 years and others averaged 3.3 years (a non-significant difference). Oil company attempts to increase community stability through recruiting of married workers may not have been successful.

Higher levels of education were associated with shorter length of residence in both samples although differences were not significant in Fort McMurray. Household size was negatively associated with length of residence in the CLR (influenced by the large number of elderly residents in the area). Fort McMurray showed similar but again non-significant trends. The attenuation of education and household size distributions in the Fort McMurray sample of primarily young, highly educated, married respondents may explain some of this departure from standard migration research results.

Ethnic and religious differences were important only in the CLR where French and Roman Catholics reported longer periods of residence in the region. Immigrants to Canada were no different in this respect from Canadian-born in either region, but migrants to Fort McMurray who had previously lived in an isolated resource community (30% of the sample) did exhibit lower stability. The latter results appear to support the "mobility breeds mobility' thesis (Shaw 1975) but not necessarily the "rolling stone" explanation of how single industry communities are dominated by young, single males who move from one resource town to another (Riffel 1975; Lucas 1971). This may have been the situation during previous construction booms but, in Fort McMurray in 1979, married respondents (of either sex) were no more residentially stable than were single males.

In the CLR sample, over 80% owned their own homes compared to about 50% in Fort McMurray. The expected difference by housing tenure was found as owners (including those with lease-purchase agreements in Fort McMurray) in both samples reported longer periods of residence in their respective regions. Government and oil company programs which subsidize home ownership in Fort McMurray appear to have had the desired effect although part of this relationship must also be a function of the greater opportunity to buy a home which longer residence in the community provides.

As expected, both the CLR and Fort McMurray studies showed that those living in single family dwellings had lived in their region longer. For example, in Fort McMurray those living in single family housing averaged 5 years residence compared to 3.7 years for those in mobile homes, 1.8 years for those in apartments, and 1.9 years in other types of multiple family housing (townhouses, duplexes). These results

do not encourage hopes of increased community stability over time, since the Fort McMurray housing trend has been away from single family housing. High construction costs and long construction times for single dwellings combined with policies of subsidizing shelter costs have led to an emphasis on mobile homes as the short term solution and multiple family housing as the long term solution. Before Suncor was built, 93% of the dwellings in Fort McMurray were of the single family type (1961). By the time construction of Syncrude was completed (1979), mobile homes comprised slightly less than one-quarter of the housing stock and single dwellings appeared to have stabilized at around 28%.

Length of Residence Multivariate Analyses

The above discussion of various correlates of length of residence demonstrates that although standard migration theory can predict some of the survey findings, both Fort McMurray and the CLR represent somewhat unique settings. In effect, the rural, highly stable, older population of the CLR represents one end of the continuum while the young, mobile migrants to Fort McMurray are found at the other end. The major problem in comparing these two situations is that many of the predictive variables are inter-related and causal effects are confounded. In an attempt to assess independent effects, multiple regression analysis (OLS) was performed separately for each sample, using years of residence as the dependent variable. Given the exploratory nature of this research, all variables (including those without significant zero-order effects) were included as potential predictors to check for possible suppressor effects. In order to simplify the presentation, equations are reported in reduced form with only significant predictors included (Table 2).

There are some similarities between the CLR and Fort McMurray equations. Age has the strongest effect in each equation but these effects were over four times larger in the CLR (b = .564 versus b = .130). In one sense, such results are trivial since older people have, by definition, had greater opportunity to stay longer. Even so, the effects of opportunity must be controlled when examining the influence of other factors. In both studies, natives of Alberta were significantly longer residents, and those with urban origins were significantly shorter residents. Both effects were

substantially larger in the CLR region (comparing unstandardized regression coefficients). Only for housing type were the partial regression coefficients similar. The relatively small standard error for the Fort McMurray estimates suggest greater reliability.

Residential stability during childhood (years resident where grew up) had the expected positive effects in the CLR. Many respondents had, in fact, grown up in the area, and this obviously contributed to accumulated stability. The direction of effects was exactly the opposite in Fort McMurray. This may indicate that those who had a history of residential stability during the "formative" years were relatively recent arrivals in Fort McMurray. This, in turn, may reflect changes in labour market demands or corporate hiring practises as Syncrude moved into its operations phase and began to employ a larger number of skilled workers from southern areas. It might also be a product of the adjustment problems faced in this community by those from a very stable background. If such individuals typically moved out of Fort McMurray earlier than average, we may simply be seeing the effects of selective out-migration.

Length of residence also had several significant determinants that were unique to one sample or the other. In Fort McMurray, those living in Waterways or Lower Town (the two oldest areas of the community), exhibited greater stability than did residents of other areas. In the CLR the only significants difference was that the rural farm population had lived in the area an average of 5.3 years longer than had other residents. Fort McMurray residents who had previously lived in isolated resource communities exhibited significantly lower stability, even when other factors were controlled. Higher education and larger household size were both negatively associated with length of residence in the CLR, and being born in Alberta and being a Roman Catholic also had positive significant effects in that sample.

Finally, both housing tenure and marital status had significant independent effects in Fort McMurray. Effects in the CLR were not significant. Those who owned their own homes had lived in Fort McMurray 1.6 years longer (net of other factors). As noted earlier, this may in part reflect the cycle of "normal" growth for the community (ownership increases with longer residence) as well as the success of housing subsidy programs. A study of "leavers" as well as "stayers" would be necessary to separate these effects. However, it is interesting to note that when the receipt of a shelter

subsidy was entered into the regression equation (as a binary variable), it did not have significant net effects on length of residence. Shelter subsidies themselves may not be what is important (some renters also receive subsidies). Rather, the significant factor is home ownership with its commitment and attachment to the community . Also, it should be noted that the effect of single family housing was just as large (b = 1.683) as the effect for ownership (b = 1.605). In one sense, what has been gained through the promotion of home ownership may have been lost through the trend towards multiple family housing.

The effects of marital status upon length of residence appear to be opposite to those intended by corporate policies. The married were hired for greater stability, yet had lived in the community a significantly shorter time (0.9 years), other things considered. These results may reflect the more recent arrival of a higher proportion of married residents among the Syncrude operations labour force. However, preliminary indications failed to show significant differences in this regard or between oil company employees and others. Thus, married respondents appear to be either latecomers or early leavers. The latter interpretation is supported by the historically high proportion of married in the community (75% of those over 15, even in 1971). Rapid growth and lags in housing and service provision may have a higher impact upon the married, particularly those with children.

Mobility Intentions

In both surveys, respondents were asked about their future mobility intentions and about their intentions when they first arrived in the area (if this was applicable). Two-thirds of the migrants to the CLR reported that they initially planned to make that area their permanent home (Table 3). Three quarters currently planned to do the same. Despite the wide-spread knowledge of the proposed oil sands plant and its possible negative social impacts, most residents expected to stay.

Fort McMurray has developed something of a negative reputation as a result of "boom-town" stories and its relative physical isolation. McVey and Ironside (1978) found that people living in other places ranked Fort McMurray last (from among 17 Alberta urban areas) as a desirable place to live. Comparisons of CLR estimates to

Table 3. Mobility Intentions: Cold Lake (1979) and Fort McMurray (1969, 1979).

Place and time of estimation of stay	Yrs planned to stay* 1 or less	1-2	3-4	5-10	Over 10	N
	Percent					
Cold Lake region						
on arrival	7.1	7.2	9.5	10.5	66.7	595
At interview	7.1	4.9	4.6	8.7	74.7	776
Fort McMurray						
on arrival						
1969	12.4	12.2	15.7	10.2	49.4	451
1979	18.4	19.7	8.1	13.1	41.7	381
At interview						
1969	27.9	14.4	18.2	16.7	22.9	402
1979	9.6	8.2	22.1	11.7	48.4	366

*Categories for years planned to stay are matched to those of Matthiasson's 1969 survey (Matthiasson, 1970). Continuous data for the 1979 AOSERP Fort McMurray survey and the 1979 Cold Lake Baseline were rounded to the nearest year. The category "over 10" includes "forever", "for good", "always", and similar responses. "Don't know" responses are omitted from the analysis. Intentions "on arrival" figures also omit those who had always lived in the region.

Matthiasson's 1969 estimates from Fort McMurray and those from a decade later (Gartrell et al. 1980) fit with this reputation. However, there are some interesting differences within the Fort McMurray samples.

On arrival, a much larger proportion of the 1979 sample (38%) than of the 1969 sample (25%) intended to stay in Fort McMurray for less than two years. Given these initial intentions, the change in plans by the time of the interview is striking. In 1969 over 25% of Matthiasson's sample reported that they planned to leave Fort McMurray within one year. Less than 10% of the 1979 sample planned to leave that soon. At the other extreme the proportion of those who planned to settle relatively permanently (10 years or more) had more than doubled from 23% in 1969 to 48% in 1979. While this was considerably lower than comparable figures observed for the CLR, it represents a dramatic increase over the decade. We cannot attribute these differences to the particular timing of the data collection since both surveys were undertaken shortly after construction had ended and the plants had gone into production.

The Effects of Stability

Despite the stereotype of the socially disorganized boom-town, participation rates for voluntary associations in Fort McMurray were similar to those observed for Canada as a whole and neighbourhood networks were just as strong as those documented in a similar 1979 survey in Edmonton (Gartrell et al. 1980). Friendship networks appeared to be stronger in Fort McMurray than in Edmonton or the CLR, but not significantly so. While neighbourhood and local kinship connections in Fort McMurray (or in Edmonton) could not match those of the longer term residents of the rural and small town CLR, comparisons of migration cohorts suggested that integration was relatively rapid within Fort McMurray. People made friends very easily.

Length of residence in Fort McMurray was not systematically related to the reported frequency of life stress events or to symptoms of individual pathology (Gartrell et al. 1980). Those who had lived in Fort McMurray only a short time were just as likely to report low levels of alienation, good moods, psychosomatic symptoms, and high satisfaction as were those who had lived there longer. Thus, increased

exposure to the boom-town environment did not appear to have a detrimental effect unless, of course, those with problems were more likely to leave. In brief, greater length of residence in Fort McMurray resulted in an increased level of social integration. This may not have been the case during construction eras but, at the start of the Syncrude operations phase, Fort McMurray displayed relatively few signs of widespread social disorganization.

Migration cohort comparisons also illustrated the dramatic increase in incomes that followed migration to Fort McMurray. New arrivals who had earned their previous year's income elsewhere reported 1978 household incomes that were similar to the Canadian average (about $16,000). Those who had arrived prior to 1978 (and had therefore earned all their 1978 income in the community) reported an average household income of over $29,000. While there was some deterioration in incomes with longer residence, differences were not large and were in part a reflection of age differences observed in the general population.

Reported non-mortgage debt was also influenced by length of residence within Fort McMurray. Multiple regression results showed that predicted debt increased over $300 per year of residence even after effects were adjusted for income and consumption levels (Gartrell et al 1980). Although average levels of debt were not extreme (about $4500), there was some substance to reports of boom-town problems of high individual indebtedness. However, greater debt with longer residence may also reflect increased credit-worthiness that would accompany residential stability.

Conclusion

As expected, the population of rapidly-growing Fort McMurray was much less stable than the population of the CLR, despite the influence of CFB Cold Lake on the latter. If the proposed development by Imperial Oil were to occur, there would undoubtedly be higher in-migration to the CLR of young, more educated, single people from outside the province of Alberta. Turnover would increase, despite present residents' intentions to remain in the area. Fort McMurray, on the other hand, will probably stabilize as the community develops and its population ages, even if a third plant is built nearby and Fort McMurray experiences a third construction boom. While

the 1979 population exhibited only marginally more stability than that present a decade earlier, there was a large change in residents' intentions to remain. The emphasis on hiring married workers (begun by Suncor) to improve stability has not achieved the expected results. However, the strong relationship between both home ownership and single family dwellings and length of residence in the community suggest policy alternatives which government and industry can pursue in this and similar communities.

Results tend to support the contention that migrants to boom towns (at least those that are resident in post-construction eras) are little different from migrants in general. Yet contrary to what was expected, past residential stability did not bring present stability. This might indicate adjustment problems and higher out-migration rates for those unaccustomed to frequent moves. Thus, while low residential stability did not have the negative effects on individuals usually described as part of the boom-town syndrome, those with problems may well be over-represented among movers. In addition, negative effects may be concentrated in certain stages of the life cycle of such communities.

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